

ABSTRACT

Disclosed is a method for forming: a Re-Cr alloy film consisting of Re in the range of greater than 0 (zero) to less than 98% by atomic composition, and the remainder being Cr except inevitable impurities; a Re-based film consisting of 98% or more, by atomic composition, of Re, with the remainder being Cr and inevitable impurities; or a Re-Cr-Ni alloy film consisting of Re in the range of 50 to less than 98% by atomic composition, Cr in the range of 2 to less than 45% by atomic composition, and the remainder being Ni except inevitable impurities. The method comprises performing an electroplating process using an electroplating bath containing an aqueous solution which includes a perrhenate ion and a chromium (III) ion. The present invention allows a Re-Cr alloy, Re-based or Re-Cr-Ni alloy film usable as a corrosion-resistant alloy coating for a high-temperature component or the like to be formed through an electroplating process using an aqueous solution, so as to provide heat/corrosion resistances to the component, even if it has a complicated shape, in a simplified manner at a low cost.